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The CROSS experiment: rejecting surface events with PSD

Neutrinoless double beta decay is a hypothetical rare nuclear transition. Its observation would provide an insight about the nature of neutrinos (Dirac or Majorana particle) demonstrating lepton number violation. This decay can be investigated with bolometers embedding the double beta decay isotope. The possibility to investigate this rare process is strongly influenced by the background level in the region of interest. The CROSS project (Cryogenic Rare event Observatory with Surface Sensitivity) aims at the development of bolometers capable of discriminating the background from surface alpha and beta interactions by exploiting the properties of superconducting Al film or normal metal Pd film deposited on crystal faces (Li2MoO4 and TeO2). These films work as pulse shape modifiers. The results of the tests on prototypes performed at IJCLab (Orsay, France) showed the capability of a few-μm (nm)-thick Al (Pd) film deposited on the crystal surface to discriminate surface from bulk events.

Mini-abstract

Thin-film-coated bolometers for 0νββ search show PSD capability between surface and bulk events.

Experiment/Collaboration

The CROSS experiment

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